REMARKS

Claim 42 is amended. Claims 21-28 and 32-44 are pending in the application.

Claims 21, 22 and 32-43 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Dunlop, U.S. Patent No. 5,809,393 in view of Xu, U.S. Patent No. 6,451,179. The Examiner is reminded by direction to MPEP § 2143 that a proper obviousness rejection has the following three requirements: 1) there must be some suggestion or motivation to modify or combine reference teachings; 2) there must be a reasonable expectation of success; and 3) the combined references must teach or suggest all of the claim limitations. Each of claims 21, 22 and 32-43 are allowable over the combination of Dunlop and Xu for at least the reason that the references, individually or as combined, fail to disclose or suggest each and every limitation in any of those claims, and fail to provide a basis for a reasonable expectation of success for the claimed subject matter when those claims are properly considered as a whole.

Independent claim 21 recites a physical vapor deposition target which consists essentially of 99.999 atomic percent pure aluminum combined with less than or equal to 1000 ppm of one or more dopant selected from the recited list, the target having an average grain size of less than 100 microns. As discussed in applicant's specification at, for example, page 3, lines 11-21; page 4, lines 8-15; page 5, lines 3-6; page 6, lines 10-19; and page 7, lines 8-22, attempts at achieving stable small grain sizes in high purity targets utilizing conventional methods has been unsuccessful. As indicated, high purity aluminum is typically provided as cast ingot and conventional processing of such material is insufficient for producing smaller grain size for LCD purposes. Additionally, the large size of LCD targets makes processing difficult. Referring to Dunlop, such discloses utilizing one

or both of liquid dynamic compaction (LDC) and equal channel angular extrusion (ECAE) in place of conventional techniques such as casting, rolling and/or forging (col. 6, ll. 11-38; col. 7, ll. 65-67; col. 4, ll. 61-63 and Figs. 3-4; and col. 2, ll. 44-67). As acknowledged by the Examiner at page 3 of the present action, Dunlop does not teach or suggest the claim 21 recited purity of aluminum. When claim 21 is considered as a whole, Dunlop does not disclose or suggest the recited physical vapor deposition target consisting essentially of the recited high purity aluminum combined with the recited dopant materials where the target has an average grain size of less than 100 microns. Further, Dunlop does not provide a reasonable expectation of successfully achieving the recited target, overcoming the problems of conventional methods discussed in applicant's disclosure.

Xu discloses utilizing a "relatively pure aluminum" target to form a wetting layer (col. 5, ll. 34-37). Xu does not disclose or suggest the claim 21 recited high purity aluminum target having an average grain size of less than 100 microns or the recited amount of dopant materials selected from the recited group. Considering claim 21 as a whole, as combined with Dunlop, Xu does not contribute to the recited combination of a target having an average grain size of less than 100 microns, having a purity of at least 99.999 atomic percent aluminum combined with less than or equal to 1000 ppm of one or more dopants selected from the recited group. Further, Xu does not contribute toward providing a reasonable expectation of success for achieving the target recited in claim 21. Accordingly, independent claim 21 is not rendered obvious by the cited combination of Xu and Dunlop and is allowable over these references.

Dependent claim 22 is allowable over the cited combination of Xu and Dunlop for at least the reason that it depends from allowable base claim 21.

Independent claim 32 recites a PVD target made by a process including casting consisting essentially of aluminum and less than or equal to 1000 ppm of one or more dopant materials selected from the recited group, the target having an average grain size of less than 100 microns. The Examiner states at page 3 of the present action and again at page 5 of the present action that Dunlop teaches a process utilizing casting. Applicant notes that Dunlop clearly teaches utilizing one or both of liquid dynamic compaction and equal channel angular extrusion in place of conventional methods such as casting (discussed above). Applicant notes that Dunlop presents Fig. 4 for comparison purposes to compare the material shown in Fig. 4 which is formed using conventional continuous casting methods, to material formed utilizing the disclosed technology of LDC and/or ECAE (see specifically the description of Figs. 3 and 4 at col. 4, ll. 61-63 and the accompanying text at col. 6, ll. 11-17). Dunlop does not disclose or suggest formation of a target by a process including casting to produce the claim 32 recited target consisting essentially of aluminum and less than or equal to 1000 ppm of the recited dopant materials and having an average grain size of less than 100 microns.

Xu does not disclose or suggest any target formation techniques or the claim 32 recited grain size of less than 100 microns. As combined with Dunlop, Xu does not contribute towards suggesting the claim 32 recited physical vapor deposition target made by a product including casting which consists essentially of aluminum and less than or equal to 100 ppm of one or more listed dopant materials having an average grain size of less than 100 microns. Further, Xu does not contribute toward providing a basis for a reasonable expectation of achieving the claim 32 recited target. Accordingly, independent

claim 32 is not rendered obvious by the recited combination of Dunlop and Xu and is allowable over these references.

Dependent claims 33 and 34 are allowable over the cited combination of Dunlop and Xu for at least the reason that they depend from allowable base claim 32.

Independent claim 35 recites a PVD target made by a process including casting and ECAE, the target having an atomic purity of at least 99.99 % and having at least one element selected from the recited group of elements. Independent claim 40 recites a PVD target made by a process including casting which consists essentially of aluminum and less than or equal to 1000 ppm of added elements selected from the recited group, the target having an average grain size of less than 100 microns. Independent claims 35 and 40 are allowable over Dunlop and Xu for at least reasons similar to those discussed above with respect to independent claims 21 and 32.

Dependent claims 36-39 and 41 are allowable over the cited combination of Dunlop and Xu for at least the reason that they depend from corresponding allowable base claims 35 and 40.

As amended, independent claim 42 recites a PVD target consisting essentially of aluminum having a purity of at least 99.99% and less than or equal to 1000 ppm of one or more dopant materials selected from the recited list, the physical vapor deposition target having a grain size of at least 20 microns and less than 100 microns. The amendment to claim 42 is supported by the specification at, for example, page 20, lines 4-7; page 22, lines 19-23; Fig. 15; page 24, lines 1-9; example 1; example 2 and example 3. Independent claim 42 is allowable over the cited combination of Xu and Dunlop for at least reasons similar to those discussed above with respect to independent claims 1 and 32, and

additionally for the reason that neither Dunlop nor Xu discloses or suggests the recited grain size of between 20 and 100 microns.

Dependent claim 43 is allowable over the cited combination of Xu and Dunlop for at least the reason that it depends from allowable base claim 42.

Claims 23-28 and 44 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Dunlop and Xu as further combined with Ueda, U.S. Patent No. 5,541,007. As discussed above, each of independent claims 21 and 42 are not rendered obvious by the cited combination of Dunlop and Xu. As indicated by the Examiner at page 4 of the present action Ueda is relied upon as disclosing additions of scandium, silicon, hafnium or titanium. As combined with Dunlop and Xu, Ueda does not contribute toward suggesting the claims 21 and 42 recited targets having high purity aluminum combined with the recited amount of one or more dopant materials having average grain sizes of less than 100 microns. Further, Ueda does not contribute toward providing a basis for a reasonable expectation of success for achieving the recited targets. Accordingly, claims 21 and 42 are not rendered obvious by the cited combination of Dunlop, Xu and Ueda and are allowable over these references. Dependent claims 23-28 and 44 are allowable over the cited combination of Dunlop, Xu and Ueda for at least the reason that they depend from corresponding allowable base claims 21 and 42.

For the reasons discussed above, claims 21-28 and 32-44 are allowable. Accordingly, applicant respectfully requests formal allowance of such pending claims in the Examiner's next action.

Respectfully submitted,

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